M829E3 120-MM APFSDS-T CARTRIDGE

The M829E3 Armor-Piercing Fin-Stabilized Discarding Sabot-Tracer (APFSDS-T) cartridge is one of the 120mm main gun rounds designed for the Abrams tank. It is a Kinetic Energy (KE) round that fires a depleted uranium rod designed to penetrate and destroy enemy heavy armored vehicles. The focus of M829E3 development is on propulsion improvements. The design is driven by the need to counter KE-effective Explosive Reactive Armor (ERA) and the desire to destroy targets at longer range than is possible with the current M829A2.

The improved tank round will support the dominant maneuver force aspect of Joint Vision 2020 by enhancing the lethality of the Abrams main battle tank.

Due to the funding threshold, the M829E3 program does not require operational test oversight from this office. However, the Army nominated this program for LFT&E oversight based on projected program cost.

BACKGROUND INFORMATION

LFT&E for this program includes both lethality and vulnerability evaluation. System lethality will be assessed with respect to expected threat tanks. The vulnerability of the Abrams tank will be assessed to ensure there is no increase in system vulnerability when carrying the M829E3 as compared to the current ammunition (M829A2). The LFT&E strategy was approved in 1QFY00 and includes both lethality and vulnerability test requirements. Event design plans for lethality and vulnerability testing were approved in 3QFY01.

The lethality evaluation for the M829E3 will leverage data from previous Joint Live Fire testing of large caliber KE munitions against threat tanks, EMD testing of production representative hardware against range targets, and a two-phase Production Qualification Test (PQT) series. Phase I PQT involves firing of M829E3 ammunition (approximately 60 rounds) against range targets, with and without ERA, representative of threat tanks. Phase II involves firing (approximately 30 rounds) against shotline simulant targets, specifically designed and constructed to represent specific combat-representative shotlines through threat tanks. Phase I PQT is scheduled to begin in August 2001.

The vulnerability evaluation will leverage data from previous and ongoing developmental test activities, including propellant characterization testing and simulated compartment tests, and a minimum

of three full-scale compartment (BH&T) tests. The full-scale compartment tests will use M829E3 stowage in two different turret load plan configurations and a single hull stowage load plan. Depending on the outcome of these full-scale tests, as many as two further full-scale tests may be conducted with threats used in previous Abrams ammunition stowage vulnerability testing.

TEST & EVALUATION ACTIVITY

EMD test activity during FY01 included firing a significant number of production representative rounds against range targets representative of the expected target set. The results of these tests are classified.

TEST & EVALUATION ASSESSMENT

The data from EMD testing of production representative hardware will be used, where appropriate, to supplement testing conducted in PQT. The LFT&E IPT reviewed these data and developed the Phase I PQT test matrix in order to best explore the performance envelope of the M829E3 against the full range of engagement conditions and expected targets.

Shotline simulant testing in Phase II PQT will serve to demonstrate the performance against targets representative of threat vehicles, and will directly support validation of M&S tools that will be used to estimate performance against the expected threat.

LESSONS LEARNED

The provision for use of shotline simulant targets in Phase II PQT represents an intelligent approach to realistic lethality testing given the difficulties inherent in acquiring representative threat targets and testing with ERA and depleted uranium ammunition.